



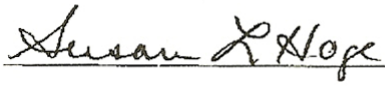
National Aeronautics and Space Administration

Goddard Space Flight Center

Exploration & Space Communications Projects Division, Code 450  
Greenbelt, Maryland 20771

**450-PSLA-SCaN Testbed**

Expiration Date: September 30, 2016  
(301) 286-7767

<p><b>Space Communications and Navigation (SCaN) Testbed</b> <b>Project Service Level Agreement</b></p>	<p><b>FY12 Operating Year Agreement</b>  <input checked="" type="checkbox"/> <b>Final Agreement</b>  <input type="checkbox"/> <b>Preliminary (Pending Budget Approval)</b> </p>
<p><b>Mission Type</b>  <input checked="" type="checkbox"/> <b>NASA</b>    <input type="checkbox"/> <b>Reimbursable</b> </p>	<p><b>Future Year Planning for</b>  <input checked="" type="checkbox"/> <b>FY13 – FY16</b> </p>
<p align="center"><b>NASA Exploration and Space Communications Projects Division</b> <b>Project Service Level Agreement Approved by:</b></p> <p><b>Project Manager</b>      <u></u>      Date <u>6/18/12</u>  Diane Malarik, SCaN Testbed Project Manager  Glenn Research Center, MAC0  21000 Brookpark Road, Cleveland, OH 44135  Telephone: (216) 433-3203; E-mail: <a href="mailto:Diane.C.Malarik@nasa.gov">Diane.C.Malarik@nasa.gov</a></p> <p><b>GSFC Networks Integration Manager</b>      <u></u>      Date <u>06/18/2012</u>  Leslie Ambrose, Networks Integration Manager  Networks Integration Management Office, Code 450.1  Goddard Space Flight Center, Greenbelt, MD 20771  Telephone: (301) 286-7767; E-mail: <a href="mailto:Leslie.L.Ambrose@nasa.gov">Leslie.L.Ambrose@nasa.gov</a></p> <p><b>Communications Service Office Manager</b>      <u></u>      Date <u>7/3/2012</u>  Brad Butts, CSO Service Manager  Communications Service Office, Code 731  Goddard Space Flight Center, Greenbelt, MD 20771  Telephone: (301) 286-3266; E-mail: <a href="mailto:Bradford.Butts-1@nasa.gov">Bradford.Butts-1@nasa.gov</a></p> <p><b>Flight Dynamics Facility</b>      <u></u>      Date <u>6/27/12</u>  Susan L. Hoge, Flight Dynamics Facility Operations Director  Navigation and Mission Design Branch, Code 595  Goddard Space Flight Center, Greenbelt, MD 20771  Telephone: (301) 286-3661; E-mail: <a href="mailto:Susan.L.Hoge@nasa.gov">Susan.L.Hoge@nasa.gov</a></p>	

## PROJECT SERVICE LEVEL AGREEMENT HISTORY LOG

Issue	Effective Date	Expiration Date	Description of Changes
FY10 CCR 450.1-000637	10/01/09	09/30/14	FY10 PSLA
FY11 CCR 450.1-000855	10/01/10	09/30/15	FY11 PSLA
FY12 CCR 450.1-001065	10/01/11	09/30/16	FY12 PSLA

## PURPOSE

This Project Service Level Agreement (PSLA) describes space communications and data system requirements for Space Communications and Navigation Program (SCaN) Testbed within the scope of services provided by the NASA GSFC Exploration and Space Communications Projects Division (ESC), whether actually performed by NASA, the customer project, or other sources. The primary purpose of a PSLA is to:

- Define the high-level requirements for services to be provided.
- Identify any development required to augment standard services.
- Identify funding responsibilities.

The contents in this PSLA will be reviewed, updated, and approved/signed as deemed necessary by the Networks Integration Manager (NIM) and Mission Commitment Engineer (MCE).

This document is under configuration management of the GSFC Networks Integration Management Office (NIMO), Code 450.1, Configuration Control Board (CCB).

Proposed changes to this document shall be submitted to the Code 450.1 CCB along with supportive material justifying the proposed change.

Changes to this document will be made by complete revision.

Comments or questions concerning this document, and proposed changes, may be addressed to:

Attention: Networks Integration Manager  
Exploration and Space Communications Projects Division  
Networks Integration Management Office/Code 450.1  
Goddard Space Flight Center  
Greenbelt, MD 20771  
Telephone: (301) 286-7767

## ACRONYMS

<b><u>Term</u></b>	<b><u>Definition</u></b>
CCB	Configuration Control Board
CCR	Configuration Change Request
CDR	Critical Design Review
CMD	Command
CNN	Communications, Navigation, and Networking
CSO	Communications Service Office
EIRP	Effective Isotropic Radiated Power
ELC	EXPRESS Logistics Carrier
ESC	Exploration and Space Communications Projects Division
ETE	End-to-End
FDF	Flight Dynamics Facility
FEP	Front-end Processor
FRR	Flight Readiness Review
FY	Fiscal Year
GSFC	Goddard Space Flight Center
GRC	Glenn Research Center
HOSC	Huntsville Operations Support Center
HTV	H-II Transfer Vehicle (ISS)
ICD	Interface Control Document
IF	Intermediate Frequency
ISS	International Space Station
I&T	Integration and Test
JAXA	Japan Aerospace Exploration Agency
JSC	Johnson Space Center
KaSA	Ka-band Single Access
LEOP	Launch and Early Orbit Phase
LL	Lessons Learned
LV	Launch Vehicle
MA	Multiple Access
MCE	Mission Commitment Engineer
MOA/MOU	Memorandum of Agreement/Memorandum of Understanding
MORR	Mission Operations Readiness Review
MSFC	Marshall Space Flight Center
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NEN	Near Earth Network
NGIN	Next Generation Integrated Network

<b><u>Term</u></b>	<b><u>Definition</u></b>
NIM	Networks Integration Manager
NIMO	Networks Integration Management Office
NISN	NASA Integrated Services Network
NOSP	Network Operations Support Plan
NRD	Network Requirements Document
NRR	Network Requirements Review
NTIA	National Telecommunications and Information Administration
PDR	Preliminary Design Review
PMR	Post Mission Report
POC	Point-of-Contact
POP	Project Operating Plan
PPBE	Planning, Programming, Budgeting, and Execution
PRD	Program Requirements Document
PSLA	Project Service Level Agreement
RF	Radio Frequency
RFICD	Radio Frequency Interface Control Document
RLV	Reusable Launch Vehicle
SAFS	Standard Autonomous File Server
SCaN	Space Communications and Navigation
SDR	Software Defined Radio
SMA	S-band Multiple Access
SN	Space Network
SNAS	Space Network Access System
SA	Single Access
SSA	S-band Single Access
STCC	SCaN Testbed Control Center
STRS	Space Telecommunications Radio System
TDRS	Tracking and Data Relay Satellite
TDRSS	Tracking and Data Relay Satellite System
TLM	Telemetry
TNSC	Tanegashima Space Center
TRL	Technology Readiness Test
TSC	Telescience Center
WAN	Wide Area Network
WGS	Wallops Ground Station
WSC	White Sands Complex

## TABLE OF CONTENTS

<b>PROJECT SERVICE LEVEL AGREEMENT HISTORY LOG.....</b>	<b>2</b>
<b>PURPOSE.....</b>	<b>3</b>
<b>ACRONYMS .....</b>	<b>4</b>
<b>SECTION A. CUSTOMER INFORMATION .....</b>	<b>7</b>
<b>SECTION B. CUSTOMER REQUIREMENTS AND STANDARD SERVICES .....</b>	<b>9</b>
<b>B.1    GSFC Networks/Data Services .....</b>	<b>9</b>
B.1.1    Near Earth Network Services .....	10
B.1.1.1    Services Provided.....	10
B.1.2    Space Network Services.....	11
B.1.2.1    Customer Requirements.....	11
B.1.2.2    Services Provided.....	11
B.1.3    Customer Integration and Test .....	11
B.1.4    Satellite Laser Ranging Services – Not Applicable .....	11
B.1.5    Radio Frequency Interface Control Document .....	12
<b>B.2    Deep Space Network Services – Not Applicable .....</b>	<b>12</b>
<b>B.3    Flight Dynamics Services .....</b>	<b>12</b>
<b>B.4    Range Services – Not Applicable .....</b>	<b>12</b>
<b>B.5    COMMUNICATIONS SERVICE OFFICE .....</b>	<b>12</b>
B.5.1    Routed Data Connections.....	13
<b>SECTION C. REQUIREMENTS FOR NON-NASA SERVICES – NOT APPLICABLE .....</b>	<b>13</b>
<b>SECTION D. SERVICE AND SCHEDULE SUMMARY .....</b>	<b>13</b>
<b>D.1    Funding Responsibility .....</b>	<b>13</b>
<b>D.2    Estimated Services For Future Years (FY13 – FY16) .....</b>	<b>13</b>
D.2.1    Customer’s Master Schedule – Not Applicable .....	14
D.2.2    Customer Deliverables – Not Applicable .....	14
<b>SECTION E. NETWORKS INTEGRATION DOCUMENTATION SET.....</b>	<b>14</b>

## LIST OF TABLES

Table B-1. SN Mission Phase Requirements.....	12
Table B-2. CSO Service Requirements .....	13
Table D-1. Estimated Services for FY13 – FY16.....	14

## SECTION A. CUSTOMER INFORMATION

**Project/Mission Full Name:** Space Communications and Navigation Program Testbed

**Acronym or Short Title:** SCaN Testbed

**Points of Contact**

**Project/Mission Funding Point of Contact**

Carolyn Clapper  
Lead Project Control Specialist  
NASA GRC/MB00  
216-433-6148  
[Carolyn.J.Clapper@nasa.gov](mailto:Carolyn.J.Clapper@nasa.gov)

**Project/Mission Ground Systems Point of Contact**

Steve Sinacore  
SCaN Testbed Mission Operations Lead  
NASA GRC/DSCO  
216-956-4365  
[Steven.A.Sinacore@nasa.gov](mailto:Steven.A.Sinacore@nasa.gov)

**GSFC/Networks Integration Manager**

Leslie Ambrose  
Networks Integration Manager  
Code 450.1, Goddard Space Flight Center  
301-286-7767  
[Leslie.L.Ambrose@nasa.gov](mailto:Leslie.L.Ambrose@nasa.gov)

**GSFC/Mission Commitment Engineer**

Devin Bitner  
Mission Commitment Engineer  
Space Communications Network Services  
301-823-2655  
[Devin.L.Bitner@nasa.gov](mailto:Devin.L.Bitner@nasa.gov)

**CSO Customer Service Representative**

Angela Culley  
CSO Customer Service Representative  
EOS/GSFC  
301-902-6033; [angela.m.culley@nasa.gov](mailto:angela.m.culley@nasa.gov)

**Category/Sponsor:**

**NASA**

- ☐ Aeronautics Research Mission Directorate (formerly Code R)  
☐ Exploration Systems Mission Directorate (formerly Code T)  
☐ Science Mission Directorate (formerly Code S, Code U, or Code Y)  
☒ Space Operations Mission Directorate (formerly Code M)  
☐ Other \_\_\_\_\_  
☐ Cooperative with \_\_\_\_\_

**Reimbursable**

- Non-NASA U.S. Government** ☐ \_\_\_\_\_  
**U.S. Commercial Space Launch Act** ☐ \_\_\_\_\_  
**Non-NASA Foreign** ☐ \_\_\_\_\_  
**Other** ☐ \_\_\_\_\_

**Mission Objectives:**

Develop, Launch, and operation of the SCaN Testbed Project as an International Space Station (ISS) testbed to provide an adaptable orbiting test and demonstration environment for space Communications, Navigation, and Networking (CNN) devices including Software Defined Radios (SDR), transmitters, receivers, antennas, network interfaces, and other peripheral devices required for complete space communication systems.

SCaN Testbed will provide NASA, industry, other Government agencies, and academic partners the opportunity to develop and field CNN technologies in the laboratory and space environment based on reconfigurable, SDR platforms and the SDR Space Telecommunications Radio System (STRS) Architecture.

**Launch/Flight Information:**

☐ Space Shuttle LV  
☒ Expendable LV  
☐ Other

☐ Aircraft  
☐ Balloon

☐ RLV  
☐ Spacecraft

**Specify: Vehicle** H-IIB

**Upper Stage** H-II Transfer Vehicle (HTV)

**Launch Vehicle Provider:** Japan Aerospace Exploration Agency (JAXA)

**Launch Site:** Tanegashima Space Center (TNSC), Japan

**Operations Site:** Glenn Research Center (GRC)

**Science Operations Site:** GRC Telescience Center

**Trajectory Regime Description:** ISS Transfer

**Launch/Flight Date(s):** July 21, 2012

**Orbit/Flight Path Data: Check all that apply:**

☐ Aeroflight ☐ High-Earth Orbit ☐ Suborbital  
☐ Deep Space ☒ Low-Earth Orbit ☐ Selenocentric  
☐ Heliocentric ☐ Formation-Flyer  
☐ Multi-spacecraft constellation \_\_\_\_\_  
☐ LaGrange Point \_\_\_\_\_  
☒ Other Attached to the ISS

**Orbital Parameters:**

**Apogee:** 358 km **Perigee:** 349 km **Inclination:** 51.6421 deg

**Other Trajectory Information:** Attached to ISS on EXPRESS Logistics Carrier (ELC) Truss

**Launch and/or Mission Critical Support Items:** July 21, 2012, Launch aboard the HTV III

**Formulation Phase Start Date:** 10/2008

**Implementation Phase Start Date:** 05/2009

**Does this support involve transfer of funds from a non-NASA entity:** ☐ Yes ☒ No

**Present Phase of Development:** Implementation

**Requirements Maturity Assessment:** ☒ 100% ☐ >80% ☐ >50% ☐ <50%

**Committed Support from** 01/2009 **to** L+5 years

**Potential Support Extension until** L+8 years

**Mission/Spacecraft Estimated Lifetime:** L+8 years

**Mission/Spacecraft Lifetime Limiting Factor:** ☐ Orbit Degradation  
☐ Radiation Degradation  
☐ Onboard Consumables  
☐ Replacement by Follow-On Mission  
☐ Other. Explain: \_\_\_\_\_

**Frequency Authorization Managed by:** Johnson Space Center (JSC)

**Other:** \*National Telecommunications and Information Administration (NTIA) frequency authorization is complete. Point-of-Contact (POC): JSC/Catherine Sham 281-483-0124.

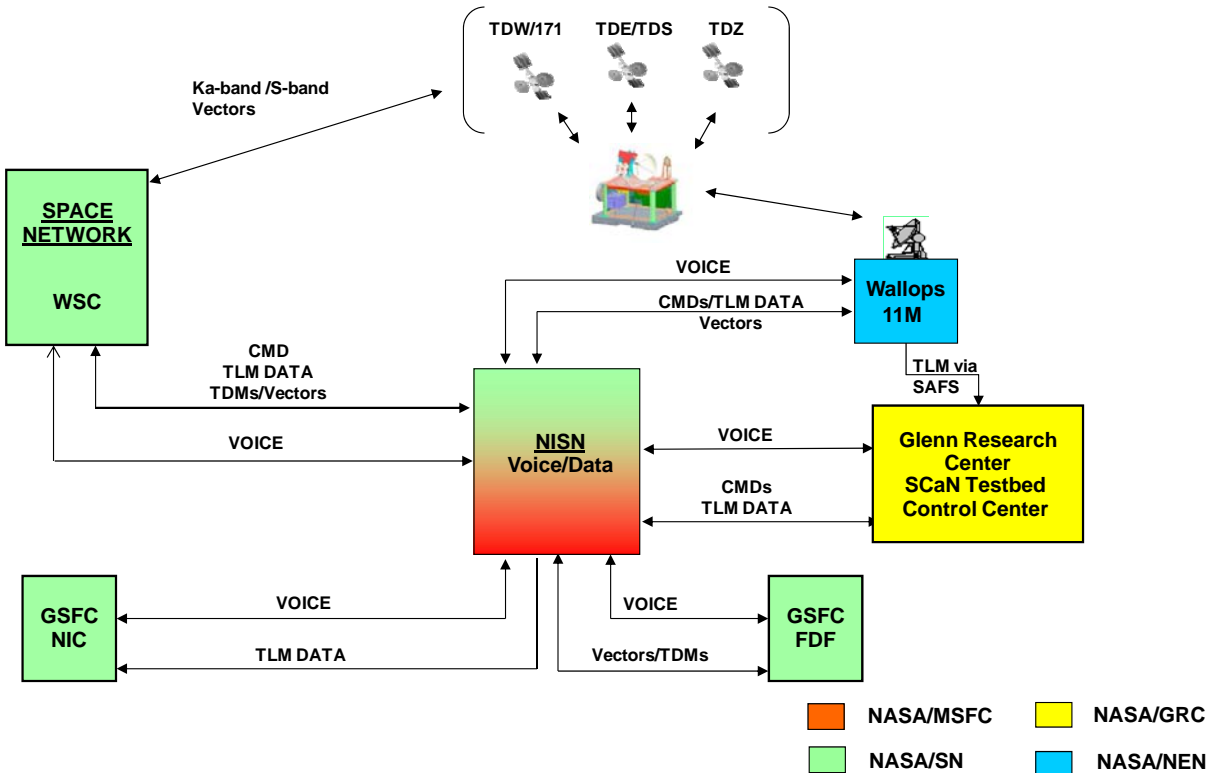


## B.1 GSFC NETWORKS/DATA SERVICES

There are two communication paths for the SCaN Testbed mission. The primary communications will exist through the ISS S-band and Ku-band links. This link will be coordinated through the Marshall Space Flight Center (MSFC) Huntsville Operations Science Center (HOSC). The HOSC will receive the data from the SN and forward it to the Glenn Research Center (GRC) SCaN Testbed Control Center (STCC) through existing architecture. See Figure B-1 for SCaN Testbed Primary Path Diagram.



The Second communication path is the experimental link with the SN and the NEN. This link will be scheduled directly by the STCC with the supporting elements. This link includes Single Access (SA) and Multiple Access (MA) services to Tracking and Data Relay Satellite System (TDRSS) and S-band to the NEN. The experimental links with the SN and NEN will be used to test future modulation, data schemes, and waveform designs with the supporting networks. The Communications Service Office (CSO) will establish the voice and data paths for the mission. See Figure B-2 for Experimental Path diagram.



**Figure B-2. Experimental Path Diagram**

### B.1.1 Near Earth Network Services

SCa-N Testbed will require S-band forward and return services from the Wallops Ground Station (WGS) located on Wallops Island, VA.

#### B.1.1.1 Services Provided

##### a. Summary Data

##### 1. NEN Mission Phase Requirements

Due to its location onboard the ISS, the SCA-N Testbed is an experiment platform. Operations will be driven by waveform experimenter requirements which are not yet defined. NEN passes will schedule approximately 50-100 per year.

##### 2. NEN Standard Link Requirements

Refer to the SCA-N Testbed RFICD, 450-RFICD-SCAN Testbed/SN/NEN.

### 3. NEN Data Distribution

Real-time Command (CMD) via Mission Network and postpass Telemetry (TLM) via Standard Autonomous File Server (SAFS).

#### **B.1.2 Space Network Services**

The SN TDRSS will provide S-band and Ka-band services for the SCaN Testbed mission during prelaunch testing activities and during nominal operations of the Testbed.

Existing communications links for ISS payloads will also be utilized by the SCaN Testbed mission.

##### **B.1.2.1 Customer Requirements**

SCaN Testbed intends to use standard SN and White Sands Complex (WSC) services where possible. SCaN Testbed intends to be compatible with the SN and WSC services at Launch. Because SCaN Testbed is an experiment for future modulation and data schemes, the SCaN Testbed Project has implemented Intermediate Frequency (IF) and Baseband services with the SN.

Currently, the SCaN Testbed 25 Msps KaSA forward link can only be manually provided through the SN data interface by coordinating with a NOM and Briefing Message until the completion of the SGSS where this capability can be automated.

##### **B.1.2.2 Services Provided**

###### a. Scheduling

SCaN Testbed SN scheduling is via the HOSC for the primary path. Experimental link S-band Single Access (SSA), S-band Multiple Access (SMA), and Ka-band Single Access (KaSA) contacts will be scheduled via the Space Network Access System (SNAS).

###### b. SN Real-time Control and Performance Data Monitoring

The SN provides real-time control and performance data monitoring for standard services.

###### c. SN Mission Phase Requirements

Refer to Table B-1.

###### d. SN Standard Link Requirements

Refer to the SCaN Testbed RFICD, 450-RFICD-SCAN Testbed/SN/NEN.

#### **B.1.3 Customer Integration and Test**

Integration and Test (I&T) will be required to ensure compatibility with the SN and NEN. Compatibility testing will be performed with both the SN and NEN.

#### **B.1.4 Satellite Laser Ranging Services – Not Applicable**

**Table B-1. SN Mission Phase Requirements**

Phase	Period (e.g., L+30 days)	No. of Contacts Required (Min./Max.) (per day)	Contact Duration Required (Min./Max.) (minutes)	Total Contact Time (minutes)	Min./Max. Interval between Contacts (minutes)	Service Requested
Testing	Prelaunch - as required	As required	As required	As required	As required	As required
Launch and Early Orbit Operations	N/A	N/A	N/A	N/A	N/A	N/A
Ops Checkout and Verification	As required	As required	10/40	10-40	As required	
Nominal Operations	Life of mission	S-band: 2 Ka-band: 3	S-band: 20/40 Ka-band: 20/40	As needed	60 minutes minimum	S-band Ka-band
Contingency	Life of mission	As needed	As needed	As needed	As needed	As needed
End of Life	N/A	N/A	N/A	N/A	N/A	N/A
Special	Life of mission	As needed	As needed	As needed	As needed	As needed

**B.1.5 Radio Frequency Interface Control Document**

The ESC's networks integration process requires a Radio Frequency Interface Control Document (RFICD) with each customer for each resource (SN and NEN) that will provide services.

The ESC shall prepare the RFICD using customer inputs. The RFICD is a bilateral document that should be completed early enough to drive the telecommunications design and ensure compatibility with the ground and/or space support structure. The final document shall be placed under ESC configuration control. The RFICD will contain, at a minimum:

- A detailed description of the telecommunications link design including Effective Isotropic Radiated Power (EIRP), antenna design information, data rate, coding scheme, etc.
- A representative set of signal margin calculations and other appropriate analyses (e.g., RF interference, customer, constraints, etc.).
- Sufficient information to define expected performance after Launch.

RF interface control requirements are described in the 450-RFICD-SCAN Testbed/SN/NEN.

**B.2 DEEP SPACE NETWORK SERVICES – NOT APPLICABLE****B.3 FLIGHT DYNAMICS SERVICES**

The Flight Dynamics Facility (FDF) shall provide orbit determination for the SCaN Testbed mission. The Goddard Space Flight Center (GSFC) organization is the Navigation and Mission Design Branch, Code 595. FDF shall also provide ISS and applicable Tracking and Data Relay Satellite (TDRS) ephemeris for SCaN Testbed SN and NEN pointing vectors.

**B.4 RANGE SERVICES – NOT APPLICABLE****B.5 COMMUNICATIONS SERVICE OFFICE**

For SCaN Testbed, CSO provides voice and data services between the elements of the SN and/or NEN and the customer's facilities located at GRC Telescience Center (TSC). CSO is managed from MSFC, with an organization at GSFC for the Mission Network services provided to their customers.

For the ISS, primary path links between the SN, MSFC HOSC, and the STCC CSO requirements are listed in the ISS Program Requirements Document (PRD). All voice requirements are also listed in the ISS PRD.

### **B.5.1 Routed Data Connections**

SCaN Testbed requires a single voice connection from the GRC STCC to both WSC and WGS for prelaunch testing and Nominal operations.

Wide Area Network (WAN) data support is required between the following locations with the bandwidths allocated for each link as depicted in Table B-2.

**Table B-2. CSO Service Requirements**

Between (Two-way COMM)		Data Type	Guaranteed Rate (bits/sec)	MTR	Start (Yrs)	Duration (Yrs)
STCC (GRC B333, Bldg. 115) FEP Connection	WSGT( Bldg T1)	ENG. Data	242 Mbps	4 hrs	L-1	L+5
	FEP Connection	CMD	27 Mbps	4 hrs		
STCC (GRC B333, Bldg. 115)	NEN	ENG. Data	8 Mbps	4 hrs	L-1	L+5
	WGS 11M	CMD	200 kbps	4 hrs		
STCC (GRC B333, Bldg. 115)	GSFC SN/NEN	Voice	8 kbps	4 hrs	L-1	L+5

## **SECTION C. REQUIREMENTS FOR NON-NASA SERVICES – NOT APPLICABLE**

## **SECTION D. SERVICE AND SCHEDULE SUMMARY**

### **D.1 FUNDING RESPONSIBILITY**

All customers are responsible for the costs to generate the RFICD and any associated analyses done to ensure the mission requirements are met. All customers will coordinate directly with FDF to pay for FDF services.

For NASA customers, the networks integration and data services will be funded to the extent that the customer's requirements are covered by the approved Planning, Programming, Budgeting, and Execution (PPBE) plan. If the total requirements of a sponsoring Enterprise or customer exceed the capacity of the Project Operating Plan (POP), the customer or Enterprise will pay the cost to acquire the additional capacity.

CSO, through their Operating Plan, provides for core services. If the customer's requirements fit within the core capabilities, then there is no charge for data or voice services. The customer is financially responsible for services between their facilities and the NISN networks. The customer will coordinate with CSO to arrange and fund additional services.

### **D.2 ESTIMATED SERVICES FOR FUTURE YEARS (FY13 – FY16)**

For planning purposes only, Table D-1 estimates the projection for operations service requirements in future years.

**Table D-1. Estimated Services for FY13 – FY16**

Service Title	Unit Description	Current Year (FY12)	Service Projections			
			FY13	FY14	FY15	FY16
KaSA	Hours	300-600	300-600	300-600	300-600	300-600
SSA	Hours	50-150	100-200	100-200	100-200	100-200
MA	Hours	125-350	225-450	225-450	225-450	225-450
S-band (NEN)	Contacts (>4 minutes)	20-50	50-100	50-100	50-100	50-100
CSO	Months	12	12	12	12	12
FDF	Months	6	12	12	12	12

**D.2.1 Customer's Master Schedule – Not Applicable**

**D.2.2 Customer Deliverables – Not Applicable**

## SECTION E. NETWORKS INTEGRATION DOCUMENTATION SET

☒ Radio Frequency Interface Control Document (RFICD)

*Radio Frequency Interface Control Document Between the Space Communication and Navigation (SCaN) Testbed and the Space Network (SN) and the Near Earth Network (NEN), 450-RFICD-SCaN Testbed/SN/NEN; <https://code450ngin.gsfc.nasa.gov/>*

☒ Network Requirements Document (NRD)

*Network Requirements Document for the Space Communication and Navigation (SCaN) Testbed, 450-NRD SCaN Testbed; <https://code450ngin.gsfc.nasa.gov/>*

☒ Network Operations Support Plan (NOSP)

*Network Operations Support Plan for Space Communications and Navigation (SCaN) Testbed, 450-NOSP-SCaN Testbed; <https://code450ngin.gsfc.nasa.gov/>*

☒ Mission Operations Readiness Review (MORR)

### Reference Documents

*Space Network (SN) Users Guide, 450-SNUG; <http://esc.gsfc.nasa.gov>*

*Near Earth Network Users' Guide (NENUG), 453-NENUG; <http://esc.gsfc.nasa.gov>*

*Interface Control Document between the Space Network and Customers for Service Management, 452-ICD-SN/CSM; <https://code450ngin.gsfc.nasa.gov/>*

*Interface Control Document between the Space Network and Flight Dynamics Facility, 452-ICD-SN/FDF; <https://code450ngin.gsfc.nasa.gov/>*

*Interface Control Document between the Space Network and the NASA Integrated Services Network, 452-ICD-SN/NISN; <https://code450ngin.gsfc.nasa.gov/>*

*White Sands Complex (WSC)/Data Services Management Center (DSMC) Operations Interface Procedure (OIP), 450-OIP-WSC/DSMC; <https://code450ngin.gsfc.nasa.gov/>*

*Configuration Management Freeze Policy for the Integrated Networks and Supporting Elements, 450-CMFP-HSF/ELV; <https://code450ngin.gsfc.nasa.gov/>*